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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/747,627	12/22/2000	Shinichiro Yamada	09792909-4734	1822

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EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 07/03/2002

6

Please find below and/or attached an Office communication concerning this application or proceeding.

↙

MF-6

Office Action Summary	Application No.		Applicant(s)	
	09/747,627		YAMADA ET AL.	
	Examiner		Art Unit	
	Jonathan S. Crepeau		1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4</u> | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Matsufuji et al (U.S. Patent 5,759,714). The reference is directed to a nonaqueous lithium secondary battery (see abstract). The negative electrode comprises a mixture of a non-carbon material (e.g., a composite tin oxide) and a carbon material (see col. 12, line 13; col. 13, line 4 et seq.; the Example). The negative electrode mixture is hot-pressed to form a sheet (see col. 14, lines 47-54).

Thus, the instant claim is anticipated.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsufuji et al. in view of Kato et al (U.S. Patent 6,150,055), in view of Beauchamp (U.S. Patent 4,228,228).

Matsufuji et al. is applied to claim 4 for the reasons stated in section 2 above. The reference further discloses in column 12, line 12 et seq. that the tin oxide is made by a crushing and classification process.

The reference does not expressly teach that the carbon material is also crushed and classified, or that both materials are crushed and classified in an inert gas atmosphere. The reference further does not teach that the hot-pressing is performed in an inert atmosphere.

Kato et al. also relates to nonaqueous lithium secondary batteries. In column 3, line 7 et seq., the reference teaches that a carbonaceous negative electrode is pulverized and classified.

Beauchamp discloses a lithium battery in column 4, line 11. In column 3, line 35 et seq., the reference teaches that "if highly reactive electrode materials are present, the preparation is carried in the absence of air and moisture, usually in a dry box under an inert atmosphere."

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of Kato et al. to perform pulverizing and classifying steps on the carbon material of Matsufuji et al. In column 3, line 12, Kato et al. teach that "pulverization prior to heat treatment is important." Accordingly, the artisan would be motivated to carry out pulverization and subsequent classification steps during the processing of the carbon material of Matsufuji et al.

Furthermore, the artisan would be motivated to carry out all of the above pulverizing, classifying, and hot-pressing steps in an inert atmosphere. As noted above, Beauchamp states that “reactive” electrode materials must be processed in such an inert atmosphere. The artisan would recognize that the materials of Matsufuji et al. are indeed “reactive,” because they tend to undesirably adsorb water from the air. This is a known problem in the nonaqueous lithium battery art, and is recognized by Matsufuji et al. at column 14, line 41 et seq. Therefore, the artisan would be sufficiently motivated to perform the pulverizing and classifying steps of the carbon and non-carbon materials of Matsufuji et al., in addition to the hot-pressing of the negative electrode, in an inert atmosphere.

5. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasunami (U.S. Patent 6,371,995) in view of Watanabe et al (U.S. Patent 6,083,644).

Yasunami is generally directed to a nonaqueous lithium secondary battery. The negative electrode comprises a mixture of a lithium-occluding non-carbon material (e.g., a composite tin oxide) and a carbon material (see col. 19, lines 25-30), and the positive electrode comprises a lithium composite oxide. In the abstract, the reference teaches that the positive electrode sheet, negative electrode sheet, and separator are wound into a battery can, and electrolyte is injected (i.e., poured) into the can.

Yasunami does not expressly teach that the winding and pouring steps are performed in an inert or dry air atmosphere.

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Watanabe is generally directed to a nonaqueous lithium secondary battery. In column 14, lines 38-40, the reference teaches that the battery is assembled in a moisture-free or inert gas atmosphere.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of Watanabe et al. to assemble (i.e., perform the winding and pouring steps) the battery of Yasunami in an inert gas atmosphere. In the cited passage, Watanabe et al. teaches that this is “desirable,” and further teaches that it is “preferred... from the point of cycle property” if the electrodes have a water content of less than 50 ppm. Accordingly, the artisan would be motivated to perform the winding and pouring steps of Yasunami in an inert gas atmosphere.

6. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniuchi et al (U.S. Patent 5,925,283) in view of Watanabe et al.

Taniuchi et al. is generally directed to a nonaqueous lithium secondary battery. In Example 14, a method for making the negative electrode is taught, which comprises the steps of mixing coke, binder and solvent by a roll mill in an inert atmosphere, and subsequently coating the slurry onto a copper current collector and drying it in the inert atmosphere.

Taniuchi et al. do not expressly teach that the negative electrode also comprises a non-carbon material.

In column 15, lines 20-30, Watanabe et al. teach a negative electrode material comprising SiO, graphite, and a binder.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the negative electrode composition of Watanabe et al. in the negative electrode of Taniuchi et al. In the abstract, Watanabe et al. disclose that their battery has "high energy density, less inner resistance and excellent charge and discharge characteristics." The abstract further teaches that the battery "has high charge and discharge efficiency, does not cause defect[s] such as inner short-circuit due to formation of dendrite[s], and it is very stable with a long cycle life." Accordingly, the artisan would be motivated to use the negative electrode composition of Watanabe in the negative electrode of Taniuchi et al, and would therefore possess sufficient skill to perform the method of Taniuchi et al. using these materials.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (703) 308-2383. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally, documents may be faxed to (703) 305-5408 or (703) 305-5433.

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700

JSC

June 26, 2002